



Lecture compiled by Dr. Sahar Zia

@Reference book:

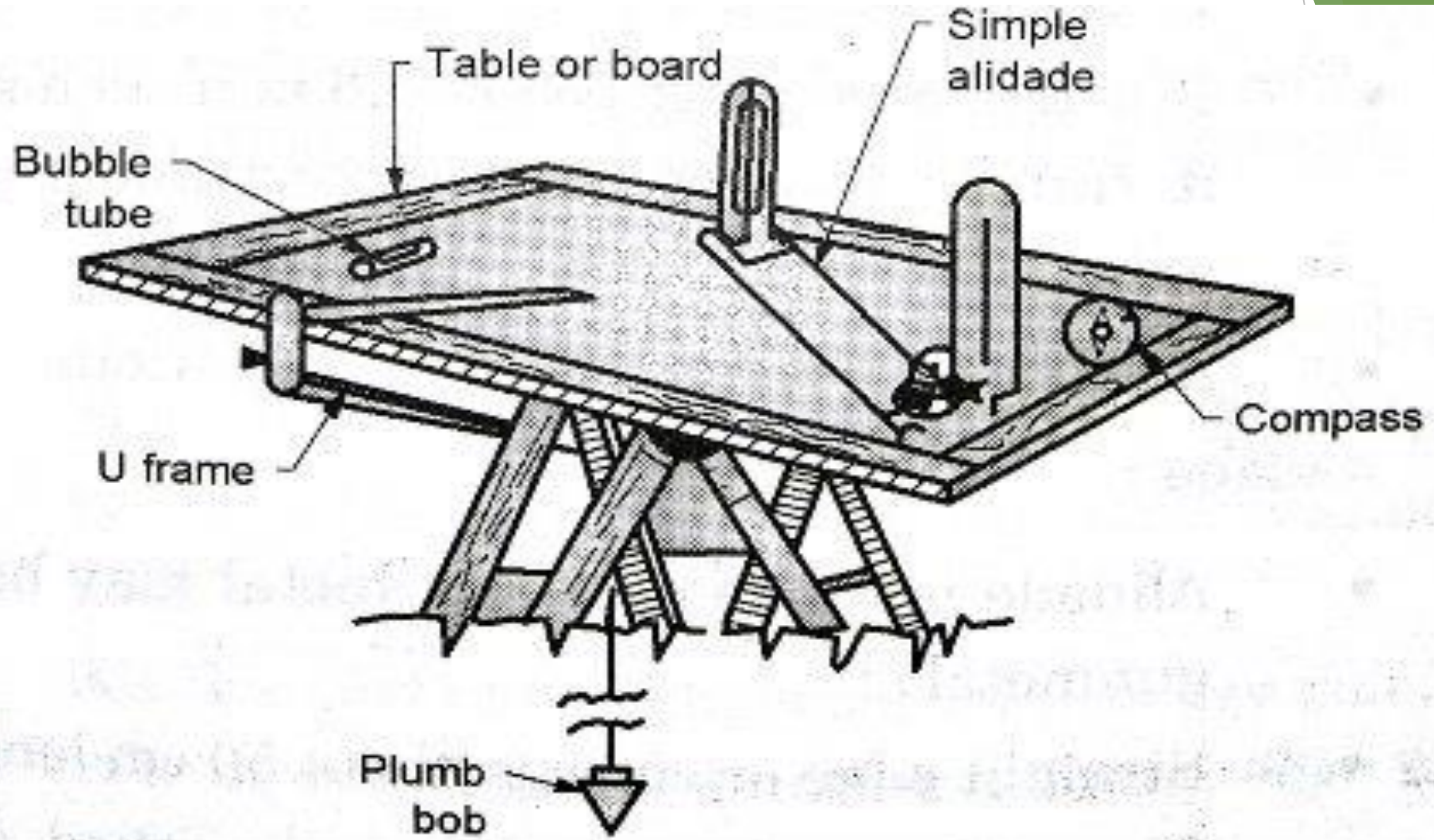
Plane Table Surveying

Learning Objectives

- ▶ Understand conventional method of mapping by plane table surveying

Plane Table Surveying

- ▶ An instrument used for surveying by a **graphical method** in which the **field work and plotting** are done simultaneously
- ▶ Most suitable for small and medium scale-mapping (1:10000 to 1:250000).



Plane Table

Advantages of Plane Table Surveying

- The observations and plotting are done simultaneously, hence there is no risk of omitting necessary details.
- The errors and mistakes in plotting can be checked by drawing check lines.
- Irregular objects can be plotted accurately as the lay of land is in view.
- It is most rapid and useful for filling in details.
- No great skill is required.
- *Plane table surveying* is less costly than theodolite survey.
- It is advantageous in magnetic areas where compass survey is not reliable.

Disadvantages of Plane Table Surveying

- Plane table surveying is not suitable for work in a wet climate and in a densely wooded country.
- The absence of measurements (field notes) are inconvenient if the survey is to be replotted to some different scale.
- It is heavy and awkward to carry and the accessories are likely to be lost.
- It does not give very accurate results.

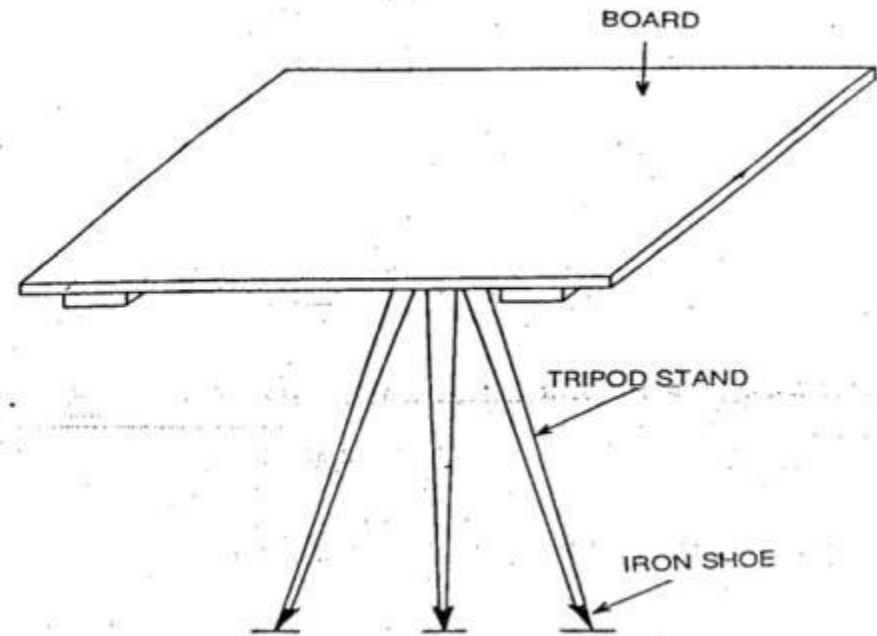
Accessories Used in Plane Table Surveying: Board

- ▶ The drawing board is carefully made of wet seasoned wood in a way to counteract the effect of warping and damages from weathering. Plane tables are available in the following different sizes.



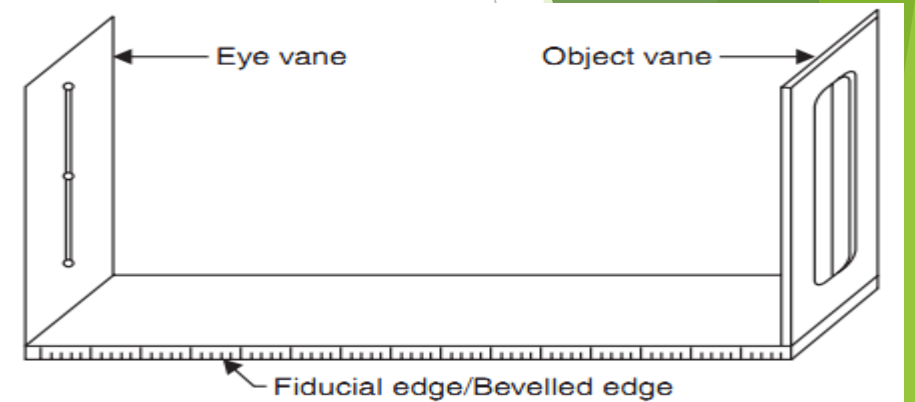
Accessories Used in Plane Table Surveying: Tripod

- ▶ An open frame type light tripod is usually provided for fixing the drawing table.



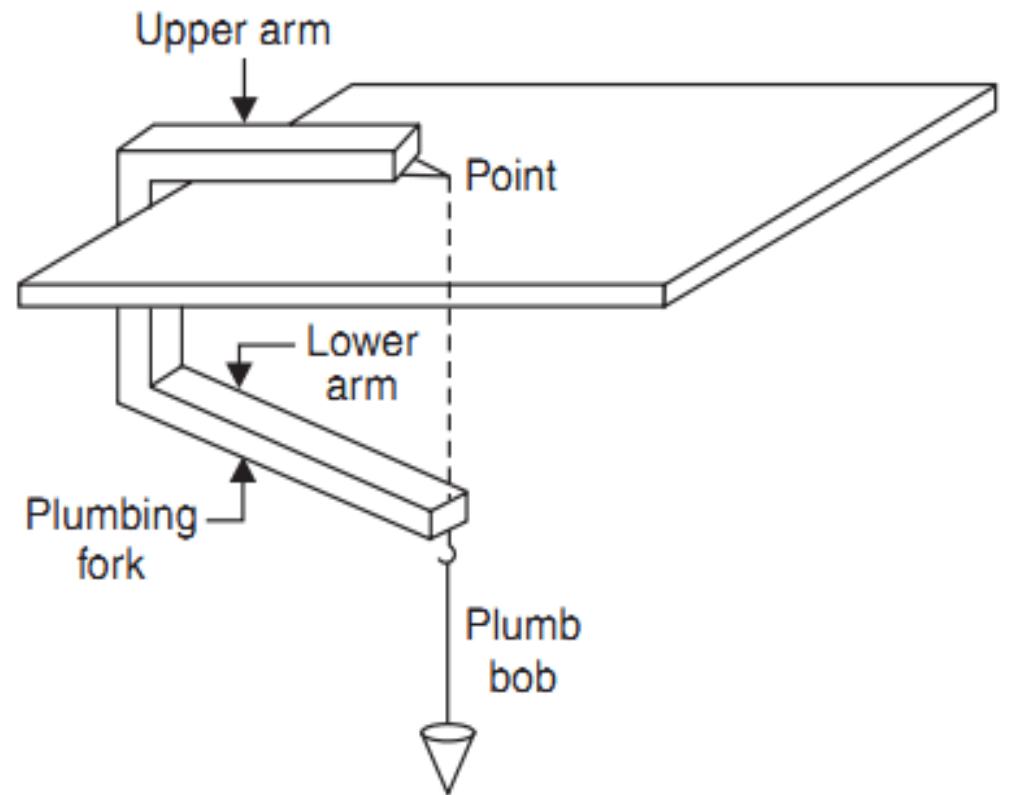
Accessories Used in Plane Table Surveying: Alidade

- It is a wooden or brass ruler of about 50-60 cm in length. It is also known as sight rule. The 'Object Vane' and the 'Sight Vane' are hinged at its two ends. The line of sight thus provided is parallel to the ruling or fiducial edge of the alidade.
- Where points too high or low are to be sighted, the accuracy and the range are considerably increased by providing a telescopic alidade. Telescopic alidade is most suitable for long inclined sights.



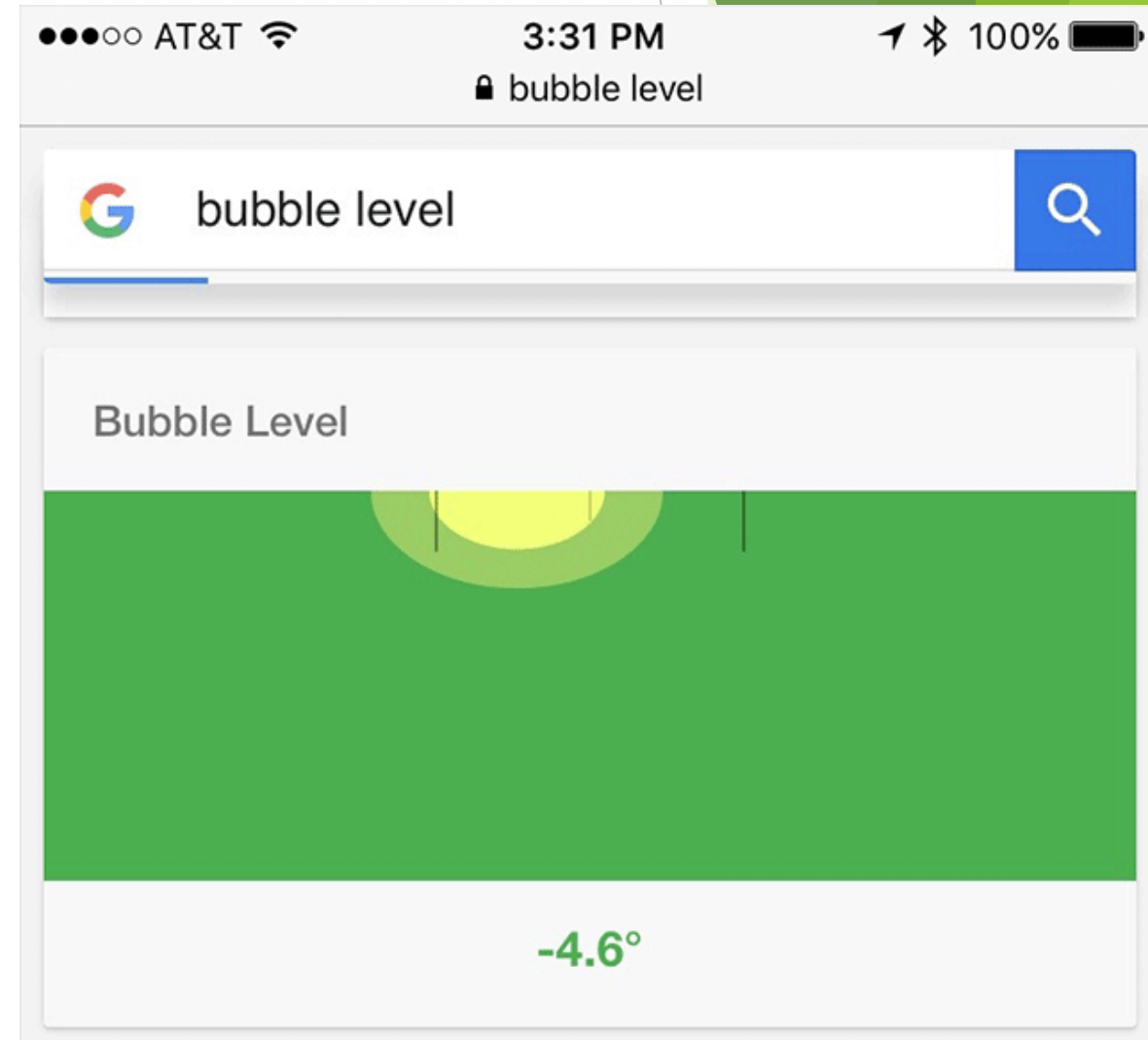
Accessories Used in Plane Table Surveying: Plumb Bob & fork

- ▶ The use of a plumbing fork is justified only if the scale of plotting is large, the rays being short. However for small-scale mapping, which is usually done with a plane table surveying, the use of plumbing fork is a sheer waste.



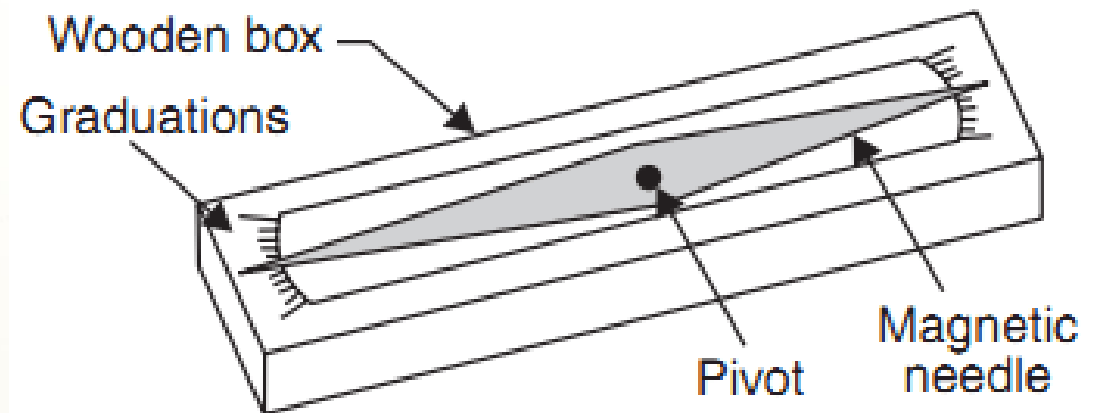
Accessories Used in Plane Table Surveying: Spirit Level

- ▶ To level the drawing board



Accessories Used in Plane Table Surveying: Trough Compass

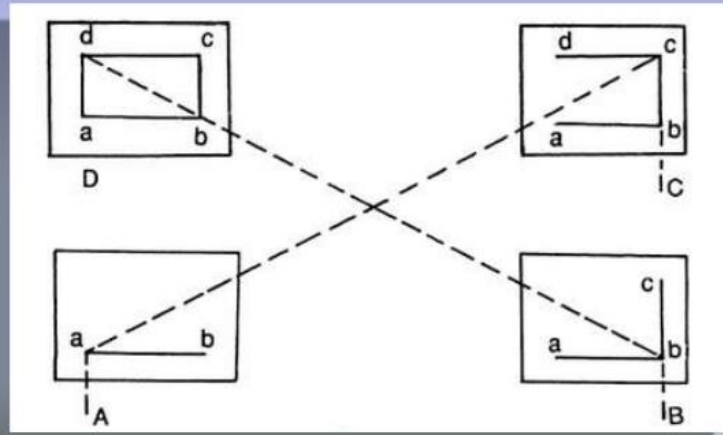
- Usually it is 15 cm long and is provided to plot the magnetic meridian (N-S direction) to facilitate orientation of the plane table in the magnetic meridian.



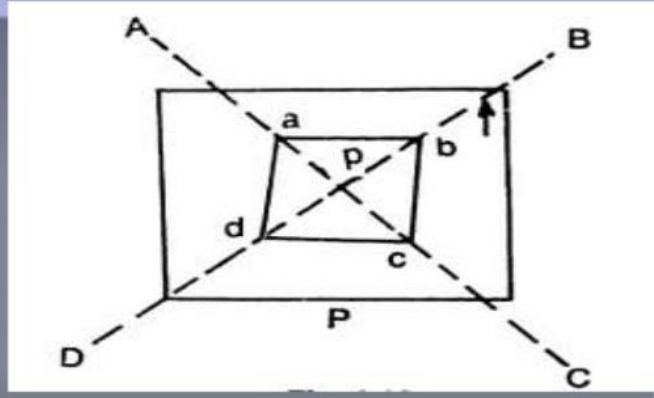
Procedure

- ▶ **Fixing** is the process in which the plane table is properly fixed on the tripod stand. White drawing sheet is then placed on the flat table and properly fixed with clips or thumb screws. During the whole process of plane table surveying care should be taken that the position of the drawing sheet should not be misplaced.
- ▶ **Centering** is the process in which the plane table is properly centered by using a plumbing fork which is very similar to plumb bob. It is used to mark the center point on the ground which exactly represents the center point on the drawing sheet.
- ▶ **Levelling** is the process in which the plane table is properly levelled by using spirit level. The plane table should be parallel to the ground surface. The survey should not be carried out until the table is properly levelled.
- ▶ **Orientation** is the process of setting the plane table into some fixed direction so that the line representing a certain direction on the plan is parallel to that direction on the ground.

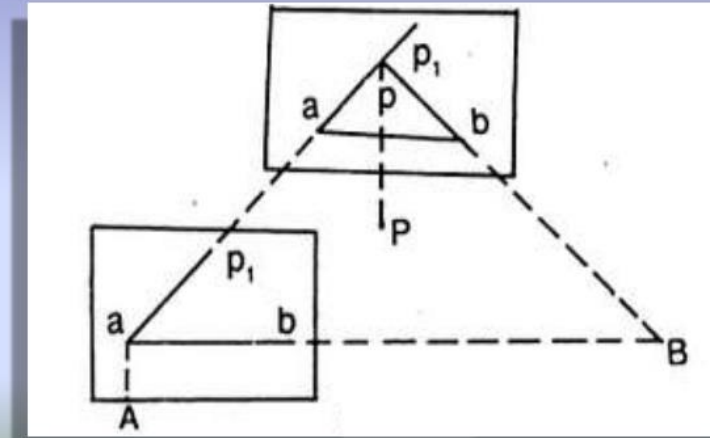
Method Of Traversing



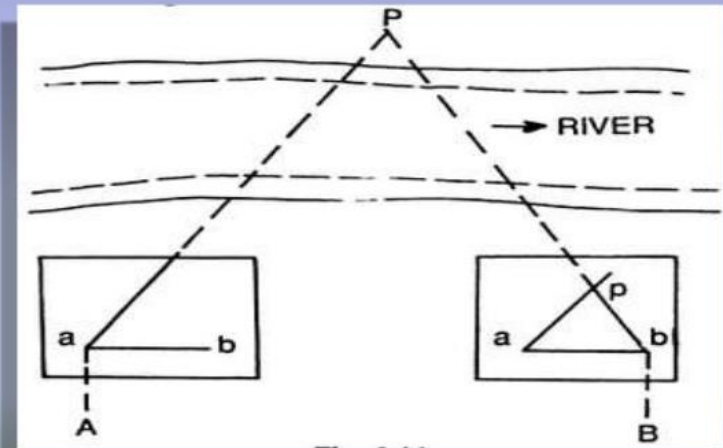
Radiation Method



Method of Resection



Method Of Intersection



of

Different Methods of Plane Table Surveying: Radiation Method

- ▶ In this method the instrument is setup at a station and rays are drawn to various stations which are to be plotted.
- ▶ The distances are cut to a suitable scale after actual measurements.
- ▶ This method is suitable only when the area to be surveyed is small and all the stations are visible and accessible from the instrument station.
- ▶ The scope of the method is increased when the distances are measured by a tachometer. In the field it is sometimes used to locate the details of the area in conjunction with the method of traversing

Different Methods of Plane Table Surveying: Traversing Method

- ▶ This method is like compass or theodolite traversing. The table is set at each of the stations in succession. A foresight is taken to the next station and the distance is cut to a suitably chosen scale.
- ▶ It is most suited when a narrow strip of terrain is to be surveyed, e.g. survey of [roads](#), railways, etc. This method can be used for traversing both the open as well as close traverses.

Different Methods of Plane Table Surveying: Intersection Method

- ▶ In this method two stations are so selected that all the other stations to be plotted are visible from these. The line joining these two stations is called base line. The length of this line is measured very accurately. This method is very commonly used for plotting details.
- ▶ It is referred when the distance between the stations is too large or the stations are inaccessible, or the ground is undulating. The most suitable example is of broken boundaries which can be very conveniently plotted by this method.

Different Methods of Plane Table Surveying: Resection Method

- ▶ It is a method of orientation employed when the table occupies a position not yet located on the drawing sheet. It is defined as the process of locating the instrument station occupied by the plane table by drawing rays from the stations whose positions have already been plotted on the drawing sheet.
- ▶ This method is employed when during surveying the surveyor feels that some important details can be plotted easily by choosing any station other than the triangulation stations. The position of such a station is fixed on the drawing sheet by resection.
 - Resection after orientation by compass.
 - Resection after orientation by back sighting.
 - Resection after orientation by two points (two-point problem)
 - Resection after orientation by three points (three-point problem)

Video

▶ <https://youtu.be/rTZQAAN4ZFA>